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PRE-APPEAL BRIEF REQUEST FOR REVIEW

	Docket Number (Optional): Solectron 735

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on January 21, 2009

Signature: Robert Moll

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Application Number	Filed
10/774,115	February 6, 2004
First Named Inventor	
Glen C. Shepherd et al.	
Art Unit	**Examiner**
2841	Tuan T. Dinh

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

- [ ] applicant/inventor.
- [ ] assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- [x] attorney or agent of record. Registration number 33,741
- [ ] attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____

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January 21, 2009
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NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

- [x] *Total of One forms are submitted.

PRE-APPEAL BRIEF REQUEST FOR REVIEW - ARGUMENTS

Applicants requested entry of amendments to claims 11, 14, and 25 to place them in better condition for appeal in amendment papers dated January 19, 2009. Specifically, applicants deleted "a surface mount component electrically connected to the conductive pad" in claims 11 and 25 and added a semicolon to claim 14. Claims 1-29 and 34 are pending.

In sections 3-4 of an Office action dated July 23, 2008 (the Office action), the Examiner rejected claims 1-29 and 34 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,811,736 to Lauffer et al. (Lauffer) and U.S. Patent No. 6,630,631 to Dishongh et al. (Dishongh).

Before we discuss this new ground of rejection, we should discuss the solder wicking problem that our invention addresses.

As illustrated in our Figure 1, when a conductive pad 32 is in close proximity to a via hole 38, the solder mask 34 won't prevent solder wicking into via hole 38. This is a matter of the gravity, the surface tension and the capillary action that the solder experiences. Even if some solder wicking into the via hole can be tolerated, the remaining solder will too often be insufficient to form a reliable solder joint 31 at the surface mount component 33.

In contrast, Lauffer teaches use of solder wicking to achieve its goal. As stated in Lauffer: "the solder is reflowed (i.e. heated) and thereby flows by gravity and surface tension well into hole 41, onto surface land 18, against surface land 38, by capillary action into the gap 51 between surface lands 18 and 38 and against lead 44 as illustrated" (See Lauffer's Figures 1-3 and col. 3, lines 40-65). Solder wicking is required to produce "the final solder arrangement" in Lauffer (See solder 55 in Lauffer's Figures 3, 6, 9, and 12).

As examiner admits, Lauffer has no plated via connected to a conductive trace (See Office action page 3). Instead, Lauffer's hole 41 is under the surface mount

component, and hence, no need for a conductive trace. And the solder 55 fills the hole 41 by solder wicking (See Lauffer's Figures 3, 6, and 9). Thus, Lauffer describes solder-filled blind-vias at the terminal end of a surface mount component, which is the opposite of what is required in claim 1.

As examiner also admits, Lauffer fails to describe a solder mask that surrounds a plated via (See Office action page 3). And Lauffer's solder mask 53 fails to reduce solder formation at the terminal end of a surface mount component as recited in claim 1 (See Lauffer's Figures 3, 6, 9, and 12).

Dishongh fails to counter Lauffer's teaching away. Instead, Dishongh's BGA package connects to the PCB through solder balls placed above vias, which promote solder wicking. And Dishongh's via plugs prove solder wicking exists (See Dishongh's Figure 1-2, col. 1, lines 13-30 and col. 2, line 51 through col. 3, line 25).

The examiner's rationale for combining Dishongh and Lauffer fails to present "a convincing line of reasoning supporting the rejection." Instead, examiner alleges it would be obvious to use Dishongh's teaching in Lauffer "to protect solder slash and prevent short circuit when the component connected to the substrate by solder" (See Office action pages 3-4). This rationale is unclear and insufficient to support combining Lauffer and Dishongh.

Yet in *KSR International Co. v. Teleflex Inc.* 126 S.Ct. 1837 (2006) the U.S. Supreme Court required examiners state "some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." The Supreme Court left undisturbed the requirement that an examiner must present a "convincing line of reasoning supporting a rejection." MPEP 2144.

In view of the above, the rejection of claim 1 involves clear legal and factual error given (1) Lauffer and Dishongh both teach away from claim 1, and (2) the

rationale for combining Lauffer and Dishongh fails to present a convincing line of reasoning supporting the rejection.

We understand that claim 1 should be interpreted broadly and consistent with Figures 4A and paragraph [0021] as set forth in *In re Morris*, 127 F.3d 1048, 1054, 44 USPQ 2d 1023, 1027 (Fed. Cir. 1997) so we now turn to the specification and drawings.

Figure 4A illustrates the solder mask 54 exposes a part of the conductive pad (e.g., the arms 96, 97) that extend beyond terminal sides 75, 76 of the component 53 to facilitate solder formation (e.g., solder joints 41, 51) between the conductive pad and the terminal sides 75, 76. The solder mask 50 prevents solder formation at the terminal end to reduce solder formation at the first plated via 55 (paragraph 0021).

Amended claim 1 captures these differences in requiring a substrate with a via and pad structure connecting a surface mount component to conductive layers of the substrate, comprising:

a surface mount component, wherein the surface mount component includes a package having an upper surface with solderable terminal sides and a terminal end;

a substrate;

a plated via connected to the conductive layers;

a solder mask surrounding the plated via; and

a conductive pad with a conductive trace connected to the plated via, wherein the solder mask exposes a part of the conductive pad that extends beyond the solderable terminal sides of the surface mount component to increase solder formation between the conductive pad and the solderable terminal sides and to reduce solder formation at the first plated via.

In view of the above, claim 1 and its dependent claims are patentable over Lauffer and Dishongh.

Dependent claim 2 is separately patentable, because it further requires that the solder mask covers a part of the conductive pad that extends beyond the solderable terminal end and reduces solder formation at the terminal end of the surface mount component. Lauffer and Dishongh clearly fail to teach or suggest claim 2.

Dependent claims 3-13 and 29 are separately patentable because each claim further requires, among other limitations, the limitations of claim 2.

Claim 14 is patentable over Lauffer and Dishongh for at least the reasons presented in connection with claim 1.

In addition, dependent claims 15-28 are separately patentable because each claim further requires, among other limitations, that the first solder mask covers and reduces solder formation at the first terminal end of the surface mount component and the second solder mask covers and reduces solder formation at the second terminal end of the surface mount component.

Respectfully Submitted,

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